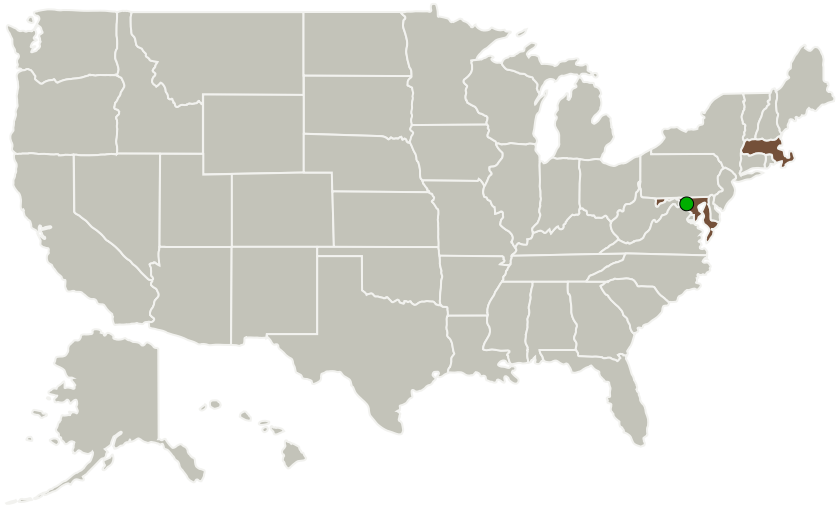
Airborne Thematic Thermal InfraRed and Electro-Optical Imaging System, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

The innovation is an advanced Airborne Thematic Thermal InfraRed and Electro-Optical Imaging System (ATTIREOIS). ATTIREOIS sensor payload consists of two sets of advanced Focal Plane Arrays (FPAs) 🗣 a broadband Thermal InfraRed Sensor (TIRS) and a four (4) band Multispectral Electro-Optical Sensor (MEOS) to approximate Landsat ETM+ bands 1,2,3,4, and 6, and LDCM bands 2,3,4,5, and 10+11. The airborne TIRS is 3-axis stabilized system capable of providing 3D photogrammetric images with a 1,850 pixel swathwidth via pushbroom operation. MEOS has a total of 116 million simultaneous sensor counts capable of providing 3 cm spatial resolution multispectral orthophotos for continuous airborne mapping. ATTIREOIS is a complete standalone and easy-to-use portable imaging instrument for light aerial vehicle deployment. Its miniaturized backend data system operates all ATTIREOIS sensor components, an INS/GPS, and an e-Gimbal Control Electronic Unit (ECU) with a data throughput of 300 Megabytes/sec. It has a volume of 0.03 m3 and a mass of 20 kg. The backend provides advanced onboard processing, performing autonomous raw sensor imagery development, TIRS image track-recovery reconstruction, LWIR/VNIR multi-band co-registration, and photogrammetric image processing. With proposed geometric optics and boresight calibrations, the ATTIREOIS data products are directly georeferenced with an accuracy of approximately one meter.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Flight Landata, Inc.	Lead Organization	Industry	North Andover, Massachusetts
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140665)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Flight Landata, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

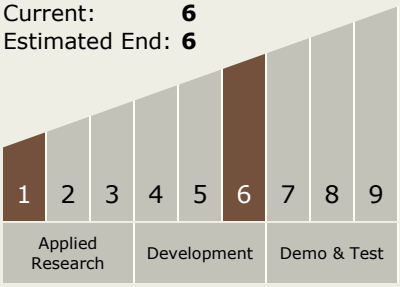
Carlos Torrez

Principal Investigator:

Xiuhong Sun

Technology Maturity (TRL)

Start: **1**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System